94-1 R&D Program Review: Preconceptual Design of MIDAS System

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Problem: **Classified Non Nuclear Parts Contaminated With Plutonium**

- **Non-nuclear parts and components removed from disassembled pits, plus fixtures and graphite molds used for fabrication, are at TRU levels of contamination. These are not candidates for reuse.**

- **Certain other components are also not reused.**

Problem: Classified Non Nuclear Parts Contaminated With Plutonium

- **Nearly all parts, components, fixtures, and molds are classified by geometry (and sometimes by composition).**

- **Safeguarding these classified parts until classified aspect is destroyed is necessary per 10CFR.**

Problem: **Classified Non Nuclear Parts Contaminated With Plutonium**

- **Since items are not reused, they are candidates for waste stream; but *no TRU classified path* can exist per 40CFR.**

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Hanford
1943–1960's

Fabrication, Rework

Hanford (Retrievable Burial)
- 1300 drums (RFETS)
- 1000? drums (HO)

NTS (Above Ground)
- 248 drums (RFETS)
- Components (RFETS)

RFETS
From 1956-1989

Manufacturing, Process Development, Rework, Retirements Disassembly, Surveillance

RFETS (Storage)
- 400 drums (potential site closure issue)
- Components

Balance of RFETS drums: How many and Where?

Los Alamos
From 1943-Present

Design Development, Test Device Fabrication, Surveillance, Disassembly

TA-55 Current Generation Plus In-Line Inventory (Baseline: About 150 parts/yr. Plus Components)

TA-55/CMR Vaults

Other Locations ?

Classified Contaminated Non Nuclear Parts

Requirements For Classified Non Nuclear Parts Contaminated With Plutonium

Demilitarization Requirement: Render an item unusable for its original weapon purpose.

- **32CFR186/650 and 41CFR245/109: Demilitarize before disposal or sale as surplus.**

Requirements For Classified Non Nuclear Parts Contaminated With Plutonium

Sanitization: Irreversible modification or destruction of a component or part of a component of a nuclear weapon … to prevent revealing
classified or otherwise controlled information …

- **40CFR260/266: Sanitize before disposal and then treat as military munitions.**

DOE Memo, 10/3/95, Revised Disposition Policy: Discard NW components per applicable regulations … AEA, RCRA, etc.

DOE Strategy For Classified Non Nuclear Parts Contaminated With Plutonium

- **Organization Formed in November, 1999: Classified Non-SNM Parts Working Group**

- **Charter: Characterize the Problem and Assess Options for Solutions. Recommend Solution(s) to HQ NMC**

Participants:
1.DP - HQ, AL, NVOO/NV, LAAO/LANL, LLNL, SNL (DPAG)
2.EM - HQ, RFO/RFETS, RL, INEEL, WIPP
3.MD - HQ, AL, SRS

DOE Strategy For Classified Non Nuclear Parts Contaminated With Plutonium

Option for Consideration by Working Group: Mobile Integrated Demilitarization and Sanitization (MIDAS) System

Investigate via Nuclear Materials Focus Area

WBS: 1.2.2.0 Preconceptual Design of MIDAS System

FY-2000 Plans for WBS 1.2.2.0, Preconceptual Design of MIDAS:

Milestones:

Preliminary Design and Requirements Summaries ……4/15/00
Preliminary Hazard Screening ……..4/15/00
DOE Briefing Package ……4/15/00
Deployment Requirements Summary ……7/15/00

Budget: $35K Released 4/7/00 by DOE AL

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Status of MIDAS and Auxiliary Systems

Completed Milestones:

- **Preliminary design and requirements summaries (50%)**
- **Preliminary hazard screening (75%)**
- **DOE briefing (100%)**

New Deliverable:

- **Per WG instructions - Develop MIDAS design basis and deployment data sufficient for DPAG analysis and comparison to other options. Due: by mid-June, 2000.**

ACWP: Too early to acquire data; estimate $8-9K.

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- Operations contained in type A transportainers
- Transportainers brought to DOE sites by diesel powered semi

- Transportainers are set and connected to site utilities
- Operation is authorized via USQ under existing SAR

- Drums are brought to deployment area for segregation and treatment
- Treated material is characterized and sent to WIPP for disposal

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MOVER Trailer

Sort & Segregate shapes from debris

Utility Trailer

Provide power, chilled water, HVAC to MOVER and MIDAS

MIDAS Trailer

Melt metal & grind graphite

- Three trailers are deployed to sites with material that requires declassification
- MOVER Trailer has been built and will be deployed to WIPP - used to open drums and sort contents
- MIDAS Trailer will house melting and crushing operations - drummed waste sent to WIPP.
- Utility trailer supports both MOVER and MIDAS trailers with power, water, chilling, HVAC support, control room.

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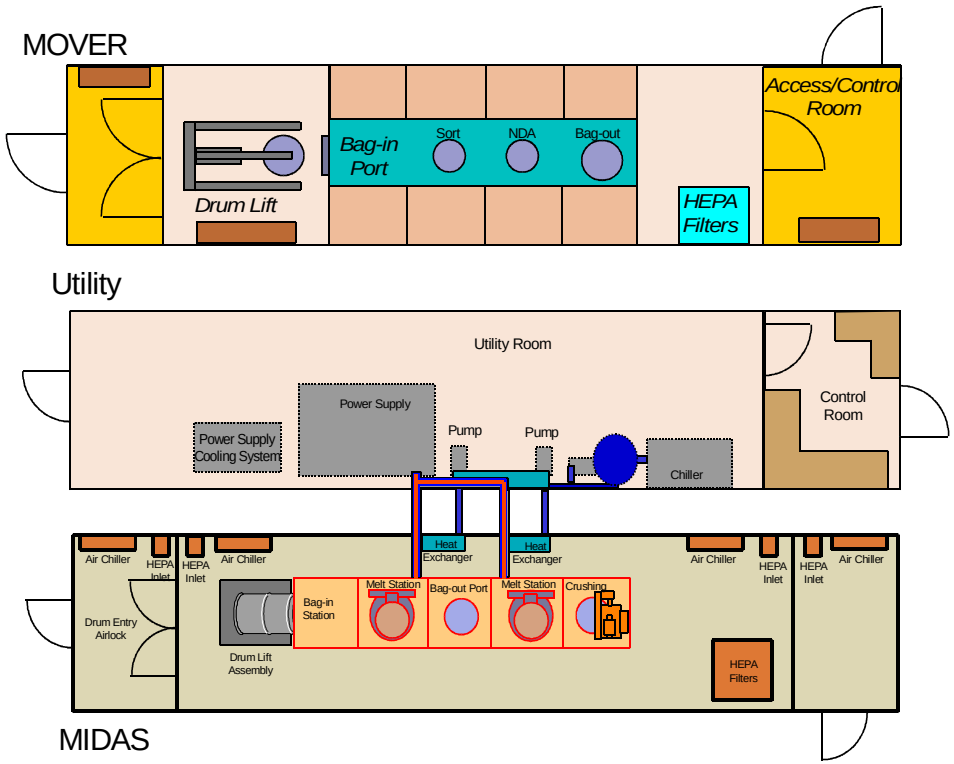

- Transportainers are 40’ long and 8’ wide.
- Gloveboxes are built to TA-55 LANL standards
- First MOVER cost about $750,000 to build and authorize. Second copy is expected to cost $550,000.
- MIDAS is expected to cost $900,000 to build.
- Utility Trailer is expected to cost $675,000 to build
- Authorization and startup will cost about $1,125,000.

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- Type A Transportable Container

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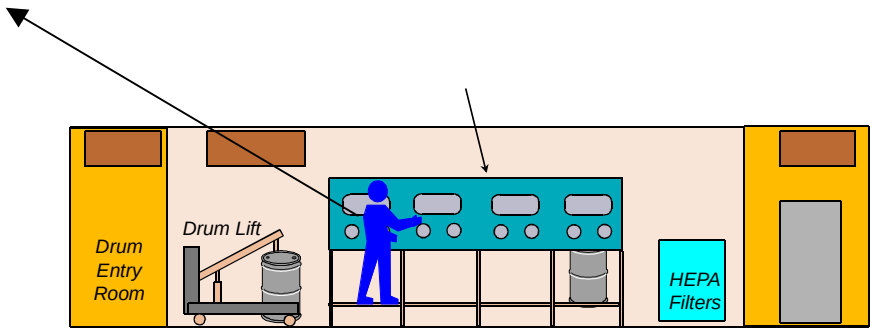
- Drum bag-on port



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- Interior glove box system
  - Drum lifted into horizontal position with hydraulic lifter
  - Drum bagged on to end port and emptied into glove box work area for visual examination of contents
  - Two bag-out ports on the bottom of the glove box allow for repackaging of drum contents

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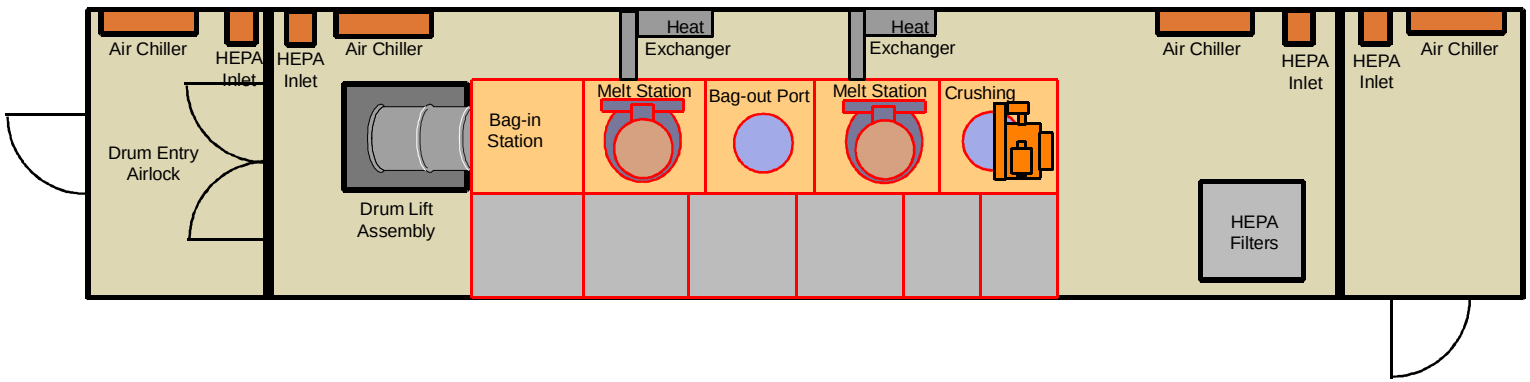
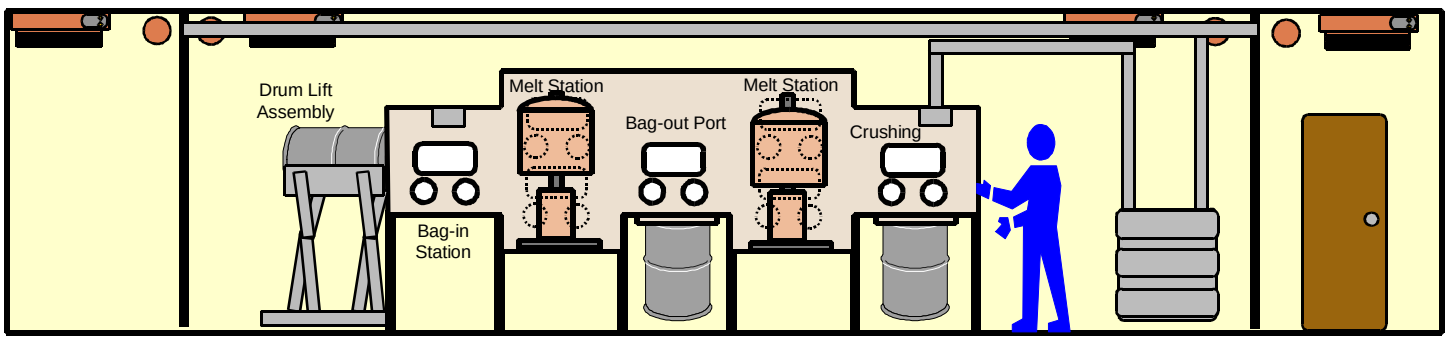
Top View



Front View



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Trailer	Element	Cost ($)
MOVER	Transportainer	150,000
	Glovebox	100,000
	Utilities	50,000
	Misc	50,000
	Eng & design support	200,000
	Total	550,000
Utility	Trailer	50,000
	Power Supply	150,000
	Chilling system	100,000
	Utilities	75,000
	Communication/Control rm	50,000
	Eng & design support	250,000
	Total	675,000
MIDAS	Tranportainer	150,000
	Glovebox	150,000
	Melters & controls	175,000
	Jaw Crusher	25,000
	Utilities	100,000
	Eng & design support	300,000
	Total	900,000
Authorization	Documentation	500,000
	Cold Testing	250,000
	Hot Testing	125,000
	Start-up	250,000
	Total	1,125,000

- Capital Cost - $3.5 million
- Includes:
  - construction of 3 trailers
  - documentation for AB
  - cold & hot testing
  - start-up @ Rocky Flats
  - contingency

Authorization Basis Requirements for MIDAS and Related Systems

- **Hazard Categorization: Category 3 based on limited (fissile) SNM inventory.**

- **Natural Phenomena Hazards: Performance Category 2 based on unmitigated release of entire SNM inventory.**

Environmental Requirements for MIDAS and Related Systems

- **No RCRA listed materials expected into MIDAS system.**

- **NESHAPs listed materials require permitting:**

    1. **Beryllium requires a beryllium melting permit.**
    2. **Radionuclides require a new source application.**

Safeguards and Accountability Requirements for MIDAS and Related Systems

- **Category 4 materials with attractiveness level D.**

- **SNM accountability required due to amounts of material present.**

- **Accountability measurements to confirm type and quantify amount needed.**

Security Requirements for MIDAS and Related Systems

- **Based on attractiveness of classified matter and on attractiveness of SNM present.**

- **Physical barriers to visual examination and access by uncleared personnel.**

Security Requirements for MIDAS and Related Systems

- **Q clearances for personnel handling materials.**
- **Physical security for unattended times.**